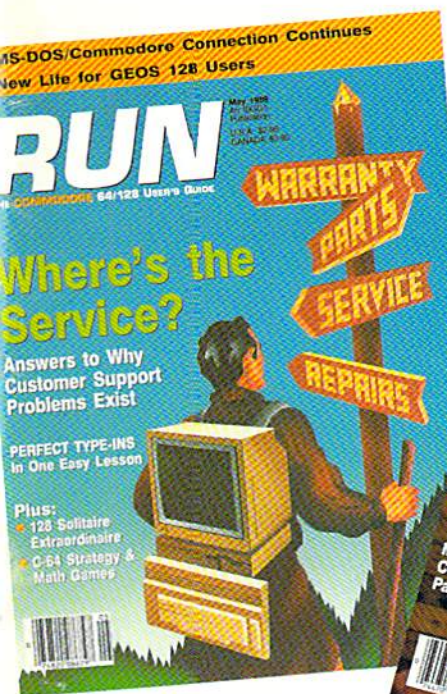


May-June 1989 Edition

# RE<sub>==</sub>RUN

## RUN Programs on Disk

For the C-64 and C-128



*Plus: Extra Bonus Programs!*

# Introduction

*May-June '89 ReRUN*

Comparing this latest ReRUN with some in the past, it's comforting to see that our ability to provide exciting and much-needed software for both the 64 and 128 hasn't changed a bit. Based on the volume and quality of the submissions we receive at *RUN*, there seems to be no end in sight to this favorable situation.

The May issue of *RUN* was filled with a good mix. We kick off this edition of ReRUN with Miklos Garamszeghy's MS-DOS Disks to Order, a 64- and 128-mode program—the second in a three-part Commodore/MS-DOS series—that allows you to create MS-DOS-formatted disks with your Commodore computer and a 1571 disk drive.

With another May program, Arithmetic-Tac-Toe, you use your C-64 to play Tic-Tac-Toe while sharpening your arithmetic skills. Written by one of our most prolific game programmers, Tony Brantner, it lets you play against the computer or a human opponent.

Plug your joystick into your computer and try out Box Scores, another C-64 game guaranteed to bring back memories of high school study hall. The objective in the two-player Box Scores game is to connect a matrix of dots one line at a time in an effort to create more boxes than your opponent.

The guru of Commodore computing, Jim Butterfield, authored the Anatomy of Calculations, or Calculator, for short. It's an interesting exercise in programming, because it shows the step-by-step process your computer uses to perform calculations. Two reports are printed after numeric input is received: one in reverse Polish notation and the second detailing the steps involved in making the calculation.

Solitaire Extraordinaire is a C-128 80-Column mode program from the May issue. As its name implies, it's a fantastic game of solitaire played against the computer. I introduced this program to a resolute non-computerist, who became fascinated with it in a matter of minutes. You're certain to find it a source of hours of card-playing fun.

If you're like most adults, you've probably dieted at one time, either to fit into new clothes or simply to improve your appearance and outlook on life. If so, you'll find our June program, Calorie Counter, to be one of the most useful application programs we've ever published. You can use it with both the C-64 and C-128 to monitor your caloric intake. We've included a large database of popular fast foods to complement this program.

Type Invaders, another Tony Brantner C-64 game, also comes from our June issue. You must type the falling letters before they reach the bottom of the screen. For variety, various levels of difficulty are available, and, for incentive, your typing mistakes are monitored and displayed at the end of each session.

The MS-DOS/C-64 Connection is the final installment in the three-part series on Commodore/MS-DOS compatibility programs. With either a 1581 or 1571 disk drive, it enables you to transfer MS-DOS files to and from your C-64.

Flight of the Condors, an arcade shoot-'em-up for the C-64, will provide you with plenty of arcade action. Quick Writer 128 is an 80-Column mode word processor. Despite the fact that it's written entirely in Basic, Quick Writer 128 is fast, efficient and enjoyable to use.

The final June program, AutoSet, from the geoWatch column, allows you to create auto-execute files for your GEOS disks. Most GEOS users, regardless of their level of experience or expertise, will find a use for this type of automatically executing file.

Two bonus programs, Betweens and C-64 Animation Maker, round out this edition of ReRUN. Betweens, a C-128 40-Column mode game, is both time- and strategy-intensive, as you try to capture your opponent's "chips" on a game board. C-64 Animation Maker is a full-featured sprite editor, animation and demonstration program that can be utilized by programmers and non-programmers alike.

Once again, that's all for this edition of ReRUN. Have fun and we'll be back soon with more exciting program action.



Technical Editor  
RUN magazine



# How To Load

## LOADING FROM MENU

To get started, C-64 users should type LOAD "MENU 64",8 and press the return key. When you get the Ready prompt, the menu is loaded and you should type RUN to see a list of the programs on your disk. C-128 users need only press the shift and run-stop keys. When all the programs are displayed on the screen, you can run the one you select by pressing a single key.

## LOADING FROM KEYBOARD

If you do not wish to use the menu program, follow these instructions.

**C-64:** To load a C-64 program written in Basic, type: LOAD "DISK FILENAME",8 and then press the return key. The drive will whirl while the screen prints LOADING and then READY, with a flashing cursor beneath. Type RUN and press the return key. The program will then start running. To load a C-64 program written in machine language (ML), type: LOAD "DISK FILENAME",8,1

**C-128:** All C-64 programs can be run on the C-128 as long as your computer is in C-64 mode. All C-128 programs are clearly labeled on the directory page. Your C-128 *must* be in C-128 mode to run these programs. To load a C-128 mode program, press the F2 key, type the disk filename and then press the return key. When the program has loaded, type RUN.

## MAKING COPIES OF ReRUN FILES

Many programs on your ReRUN disk have routines that require a separate disk onto which the program writes or saves subfiles. To use these programs, you must first make a copy of the original program onto another disk that has enough free space on it to hold these newly written subfiles.

It's simple to make a copy of a Basic program. Just load it into your computer as outlined above, and then save the program back onto a separate disk that has plenty of free space for extra files.

Copying an ML program is not so simple. You cannot simply load and save an ML program; you'll need to use a disk-backup utility program, such as the one on your Commodore Test Demo disk.

# Directory

PAGE	DOCUMENTATION	DISK FILENAME	FILE TYPE
		*MENU 128 _____	BASIC
		MENU 64 _____	BASIC
1	MS-DOS DISKS TO ORDER	MS-DOS FORMATTER _____	BASIC
3	ARITHMETIC-TAG-TOE	TIC-TAC MATH _____	BASIC
4	BOX SCORES	BOXES _____	BASIC
5	ANATOMY OF CALCULATIONS	CALCULATOR _____	BASIC
6	SOLITAIRE EXTRAORDINAIRE	* SOLITAIRE _____	BASIC
8	CALORIE COUNTER	CALORIE LIST1 _____	BASIC
		CALORIE LIST2 _____	BASIC
13	TYPE INVADERS	TYPE INVADERS _____	BASIC
14	THE MS-DOS/C-64 CONNECTION	MS-DOS 64 _____	BASIC
		MS-DOS GEN _____	BASIC
		M64.ML3 _____	ML
18	FLIGHT OF THE CONDORS	BOOT CONDORS _____	BASIC
		CONDORS HEX _____	BASIC
		+SPACE CONDORS _____	ML
		SPRITE HEX _____	BASIC
		+CONDOR SPRITES _____	ML
19	QUICK WRITER 128	* QUICK WRITER 128 _____	BASIC
22	AUTOSET	AUTOSET _____	BASIC
24	£ BETWEEN	£ BETWEEN _____	BASIC
25	£ C-64 ANIMATION MAKER	£ ANIMATE MAKER _____	BASIC
		£ ANIMATION DEMO _____	ML

\* — C-128 mode only

£ — Bonus program

Before you run a program, carefully read the documentation that pertains to it.

# MS-DOS Disks to Order

By Miklos Garamszeghy

PART I OF THIS SERIES of articles (*RUN*, April 1989) presented a program, The MS-DOS Connection, that allows the C-128 to copy files to and from MS-DOS disks. The program accompanying this article lets you format new MS-DOS disks automatically on your 1571 drive, using either a C-128 or C-64. You can thus provide yourself with a supply of MS-DOS-formatted disks to use with any MS-DOS file transfer program for the 64 or 128—without depending on the availability of an MS-DOS computer.

The Commodore 1571 disk drive has the capability of formatting disks in the industry-standard MFM recording method. MFM is used by most CP/M, MS-DOS, Atari ST and even Amiga computers. Therefore, with a little knowledge and imagination, you can format virtually any type of disk with a 1571 drive. Unfortunately, 3½-inch disks formatted on a 1581 drive will not work in IBM-type machines under any circumstances. This article is therefore concerned only with 5¼-inch disks formatted in the 1571 drive.

Note that the MS-DOS disk created with this program is a “non-system” disk; therefore, it will not be “bootable” under MS-DOS. However, you can easily make it into a boot disk by using the MS-DOS program SYS.COM to transfer the required system programs to it.

## USING THE PROGRAM

MS-DOS Disk Formatter can create MS-DOS disks in any of four standard types: single-sided, with either 8 or 9 sectors per track, or double-sided, with 8 or 9 sectors per track. The program assumes that you will create your disks on device 8. If you want to use another drive, such as device 9, change the value of the variable DV in line 100 to the appropriate value.

MS-DOS Disk Formatter presents prompt and status messages to let you know what is going on. When you run the program, you first get a brief sign-on status message, asking you to wait while the

Data statements are being read and table values initialized. For C-128 users in 80-Column mode, you can speed things up by entering the Fast command beforehand.

Commodore 64 users must add the following line to make sure that the 1571 disk drive is in 1571 mode, not 1541-Emulation mode, which is the power-up default for the C-64.

```
481 PRINT#15,"U0>M1"
```

When the main menu appears, you can select the type of disk to format. The "9 sector, double-sided" format (selection 2) is by far the most common MS-DOS disk format. However, all four disk types are fully supported by MS-DOS 2.0 or later versions thereof. They are also supported by the C-128 version of The MS-DOS Connection file-transfer program and the C-64 version thereof, which is on page 14 of this booklet and on the disk.

After selecting the type of disk to format, you are prompted to insert a new disk into the drive and then to press any key to continue. As with any formatting process, all existing information on the disk will be destroyed. If you decide to abort the formatting process, just press the run-stop key. If you then decide to continue, press any other key and the formatting process will resume.

Throughout the process, messages are displayed on the screen to inform you of the step currently being performed. The first is the actual formatting of the disk. This will take about 20 seconds for a single-sided disk or 40 seconds for a double-sided one. The next step is to write the boot block and the file allocation table (FAT) sectors to the disk. The MS-DOS FAT is similar to the Commodore DOS's bit allocation map (BAM), which keeps track of the status of sectors on the disk.

Since the program uses the normal serial bus and not Burst mode for sending data to the disk drive, the sector-writing process may take a moment or two. After the process is complete, you are returned to the opening menu. If you don't wish to format any more disks, simply select option 5 to quit.



# Arithmetic-Tac-Toe

By Tony Brantner

ROUND UP THE KIDS and bring them over to the computer. It's time to have fun—and practice arithmetic—with Tic-Tac-Math, a C-64 version of tic-tac-toe, in which players solve addition, subtraction, multiplication and division problems to capture squares. Two people can play against each other, or one person can play against the computer.

When you run the program, there's a brief delay while the game is set up, and then a menu asks which math operation you'd like to practice, the number of people playing, the skill level (1-3) desired and the time limit for solving each problem (15 seconds, 30 seconds or no limit). After the questions are answered, the vividly colored game screen appears.

As in the traditional game, Tic-Tac-Math players take turns. Each turn consists of selecting an empty square, 1-9, to mark and solving a math problem. If you answer correctly, a short fanfare will proclaim that you've won the square, along with one point, which is added to your score. If you exceed the time limit or give a wrong answer, the right answer is displayed, and you lose that turn. The first player to capture three squares in a column, row or diagonal wins the game and scores an additional three points.

Note that entering 0 at a prompt for the square number ends the game early and returns you to the menu. Use this feature at the first prompt to change the game parameters.

The C-64 is very good at arithmetic, so it always gets right answers. However, it's not perfect at choosing squares, so if you can't find a human opponent, try to beat the machine! •



# Box Scores

*By Michael Murtagh*

REMEMBER THAT PENCIL-AND-PAPER GAME you played as a kid, where you and your opponent connected the dots in a big square matrix, with the objective of completing, and thus claiming, the most squares? Well, Boxes is a C-64 version of that game. It's fun and challenging to play, and suited to both children and adults.

The game can be played with one or two joysticks; if only one will be used, plug it into *port 1*.

The program begins by asking you and your opponent to enter your names. Then it displays a six-by-six matrix of stars (instead of dots) and tells the player who entered his or her name first to take a turn. After that, you and your opponent usually alternate.

When it's your turn, use the joystick lever to move the cursor-line to an empty space between adjacent stars and then press the button to replace the cursor-line with a box-line. To move the cursor-line horizontally or vertically, you press the joystick lever left-right or up-down. Moving the lever diagonally switches the cursor line from horizontal to vertical position, or vice-versa.

If you complete a box, you win it, and your player number (1 or 2) appears inside it; you also then have another turn. If you don't complete a box, control passes to your opponent. To prevent confusion, the program always displays the name of the player whose turn is next. The winner is the player with the greatest number of boxes when the matrix has been completely filled in. After a winner has been declared, you can play another game, and the previous loser has the first turn.

Boxes is easy to learn, but it's tricky and not at all easy to win!

# Anatomy of Calculations

By Jim Butterfield

CALCULATOR IS A TWO-FOR-ONE arithmetic program that evaluates expressions employing either decimal or hexadecimal numbers. As a bonus, it lets you see a couple of related programming concepts—stacks and reverse Polish notation—at work.

The program accepts both decimal and hexadecimal integers as input, and you can use both bases in the same calculation—just put a \$ before any hex number you enter. It will not accept decimal fractions *per se*, but you can get around this limitation by substituting expressions such as, for example,  $37/10$  or  $3 + 7/10$  for the decimal 3.7.

You can type in either single numbers, to get their decimal or hex equivalents, or expressions to be evaluated. Make entries in the style of Basic, using + for addition, - for subtraction, \* for multiplication, / for division and ↑ to raise to a (positive integral) power. You may use parentheses to indicate which calculations should be done first. Calculator follows the Basic conventions for the order of operations, raising to a power first, then multiplication and division, and finally addition and subtraction.

Calculator always gives answers in both decimal and hex form, with the hex rounded to the nearest integer. (If a result is negative, the hex version is shown as its 2's complement, which I haven't space to explain here.)

If you enter an expression that can't be evaluated, the computer echoes the line as far as the snag, then adds a series of question marks. For example, if you type  $3 + 4^{**}5 - 1$ , the computer will respond  $3 + 4^{**}???$  to tell you where it got lost.

The program issues two reports on how an evaluation was done. The first shows your expression converted to reverse Polish notation (see below), and the second details the arithmetic steps in the evaluation, using descriptions such as "multiply 4 by 5" and "add 20 to 3." You can turn off the reports by removing the word REM from lines 700 and 850.

After the program has displayed the result of a calculation, it asks

for new input. To stop the program, type an illegal expression; the letter E for "end" will do nicely.

## REVERSE POLISH NOTATION

Computer scientists have long used reverse Polish notation (RPN), in conjunction with stacks, to increase the efficiency of calculations. The Forth computer language uses this notation, as do many calculators, notably those made by Hewlett-Packard.

In RPN, an arithmetic operator (+, \*, or whatever) *follows* the numbers it is to operate on; thus,  $3 + 4$  becomes  $3\ 4\ +$ . To help you see how RPN works, let's trace the steps used to evaluate the following expression:  $3 + (9 - 4 * 2) + 7$ .

First the computer translates the expression into RPN:  $3\ 9\ 4\ 2\ * - + 7 +$ . Then it puts the 3, 9, 4 and 2 onto the stack (in that order, so the 2 is on top), multiplies the top two numbers (2 and 4) and places the result (8) on the stack, so it contains 3, 9 and 8. Next the computer subtracts the top number on the stack (8) from the second number (9) and places that result (1) on the stack, leaving it with 3 and 1. The machine adds these together, producing 4, then puts the 7 on the stack and does the final addition, for an end result of 11. All without parentheses!

Now take a look at the code. Lines 200–290 store the characters you enter into array C. When you press the return key, the computer scans these characters and places the operators (in proper order) on the stack, array S, ready to pop back out when needed. Then lines 400–610 convert the expression to RPN and store it in array B. The actual computation, using the stack again, but in a different way, happens in lines 800–950.

---

RUN it right: C-128 (in 80-Column mode)

# Solitaire Extraordinaire

By Michael Broussard

FIVE-BY-SEVEN IS A COMPUTER VERSION of a solitaire game—unaccountably called Golf—that I learned from a friend of mine.



The object is to eliminate all the cards from a 5-row-by-7-column layout before the rest of the cards in the deck are exhausted.

The game is easy to learn but devilishly difficult to win. It's also addictive, and, since it doesn't take long to play, you'll find yourself saying, "Well, just *one* more before bed."

When you start the program, and it asks whether you want directions, answer Y to see a brief summary of the rules. Otherwise, press any other key to begin play.

There's a brief delay as the cards are "shuffled;" then the layout appears on the screen, with a face-down card, representing the remainder of the deck, to the layout's left. The number on this card is the number of cards that are left in the deck.

At the start, a lone turned-up card is exposed in the discard area at the bottom of the screen. Cards are played from the bottom of each column in the layout face-up onto the currently exposed card in the discard area.

Each column of the layout is identified by a letter of the alphabet; to play a card, just press the appropriate letter. When you can't (or choose not to) make any more moves from the layout, press the space bar or the colon key to deal a card from the deck. If the deck runs out before you eliminate the layout, the game is over and you lose.

For a card to be playable, it must differ in rank by one from the card exposed in the discard area, but it may be of any suit. For example, if the exposed card is a six, you can play any five or seven that's showing at the bottom of a column. Ace is low and king is high, so you may play an ace only on a two, but never on a king. In fact, since the king is at the top of the sequence, only a queen can be played on it.

Surprisingly, it's all right to take back the last move you made from the layout. To "undo" a move, just press U. Note that the Undo command doesn't work if you last dealt a new card from the top of the deck; that would give unscrupulous players a way to cheat.

You can abort a game in progress by typing an exclamation point. Then the program will give you the option of playing another game or returning to Basic.

If you don't like the background or character colors in the screen display, it's possible to change them by altering line 100 in the listing. The Color command in that line sets the background color, and variable Q\$ holds the code for the character color.

You'll find that there's more strategy to Five-by-Seven than ap-

pears at first glance. For example, you must be careful when removing queens from the layout, as they're the only cards on which kings may be played. If you play the last queen, and there's still a king buried, you'll never win.

So, that's it—short and sweet. And now that this article is finished, maybe I have time for just one more. . .

---

RUN it right: C-64 or C-128 (in 40-Column mode); printer optional

# Calorie Counter

*By Michael Broussard*

WHAT COULD BE A MORE WEIGHTY SUBJECT than dieting? If changing your eating habits weren't enough, you also have to count calories and continually monitor your progress. However, Calorie Minder can help. This Basic program for the C-64 and C-128 calculates your "ideal" weight and keeps a daily record of your weight and calorie intake. It also reports on your progress, showing how your weight loss (or gain!) compares to your expected weight change, based on the amount you claim to eat.

Before describing how the program works, I'll take a moment for a few cautions. First, don't embark on any weight-loss program without checking with your doctor, especially if you're pregnant. Second, the calculations of ideal weight and the gain/loss analyses provided by Calorie Minder are based on "average" metabolism, so don't be surprised if you don't lose at exactly the rate predicted. Finally, research has shown that dieting alone is not the best way to maximize weight loss. You should also engage in some form of aerobic exercise, such as walking briskly for 20 minutes a day, riding a bicycle or taking an aerobics class.

## THE FOOD LIST

In order to operate, the files Calorie Minder and Calorie Data should both be copied to a work disk. Furthermore, Calorie Minder needs to have a sequential file of calorie data for the foods you eat available on disk. My version of the file, which you will use

for starters, is created by the Calorie Data program. The program expects your disk drive to be device 8, but you may alter this by changing the value assigned to variable D in line 100.

The foods and calorie values known by Calorie Data are defined in Data statements beginning in line 1000. If you don't eat some of the foods I've included, just omit those Data statements. Conversely, if I left out any of your favorite foods, add Data statements describing them. I purposely omitted some foods, such as celery and lettuce, because they have so few calories; go ahead and add them, too, if you're determined to count every single calorie. Just be careful that each statement you add is in the proper format: a food description of up to 29 characters, a comma, then the number of calories associated with that food. Also make sure there are no commas or semicolons embedded within the food descriptions, or Calorie Data will abort with an error. For example,

```
1450 DATA ONIONS/SLICED 1 CUP,110
```

is acceptable, while

```
1450 DATA ONIONS, SLICED, 1 CUP,110
```

is not.

The last Data statement in the program, containing DATA \*\*\*, is the "end-of-data" indicator. You may add as many Data statements to Calorie Data as you like; just be sure this one comes last.

There's also a special indicator, DATA !!!, dividing the Data statements into two groups. All the foods before this indicator appear at the beginning of CAL.DATA in the same order as in the Data statements; the foods after the indicator are sorted alphabetically. This arrangement lets you keep foods you eat all the time at the top of the list, where you can find them quickly.

Calorie Data has only three foods—the "miscellaneous" entries described below—in the first group. If you want all the foods sorted in a single group, just omit the Data statement containing the !!!.

Or, if you want the data completely unsorted, change the value of variable SF in line 100 of Calorie Data to 0 and rearrange the Data statements in any order you wish.

After using Calorie Minder for a while, you may decide you want to alter the food list. No problem. Just load Calorie Data, change the Data statements as desired and run it again; it will create and save a revised CAL.DATA file. Be sure to save your modified version of Calorie Data, as well.



Note that the values in Calorie Data assume plain preparation of foods, with no other foods added in. For example, pasta means boiled pasta with no sauce, and carrots means boiled carrots with no butter.

A book that lists calorie values would be a wise investment for use with Calorie Data. It can be a handy reference when you're adding foods to the list.

## USING CALORIE MINDER

When you run Calorie Minder, it starts the initialization process by reading in the food and calorie information from CAL.DAT, so be sure the work disk containing that file is in the drive.

Next, it displays a window containing my name, Mike, and inviting you to enter your name instead. If you're Mike, too, just press return; otherwise, delete my name, enter your's (up to 12 characters) and press return. Your name will appear in the file copy you then save, but to change the default name in the program, insert your name in place of Mike as the value of variable NM\$ in line 10. Your name will then appear as the default the next time you run the program.

Once you've entered your name and pressed return, Calorie Minder searches the disk for a file called <your name>.DAT containing your calorie profile. Of course, when you first run the program, it doesn't find such a file, so it asks for information to use in creating one when you exit the program. Enter one or two digits for the year, month and day at the appropriate prompts, or, if you've used Calorie Minder before, enter the parts of the date that have changed and press return for the rest. Next, enter your height, sex, body-frame type and exercise level, and the program computes your ideal weight, lets you set a weight goal for yourself, derives a rec-

**Figure 1. Calorie Minder Main Menu.**

- 1 COUNT CALORIES
- 2 ANALYZE CALORIE LOG
- 3 IDEAL WEIGHT ANALYSIS
- 4 CHANGE DATE
- 5 EXIT PROGRAM

**Figure 2. Count Calories submenu.**

- 1 ADD CALORIES
- 2 NEXT SCREEN
- 3 PREV SCREEN
- 4 SUBTRACT CALORIES
- 5 SAVE CALORIE DATA
- 6 MAIN MENU

ommended daily calorie intake and predicts how long it should take to reach your goal.

When initialization is complete, Calorie Minder's main menu display appears, offering the options shown in Figure 1 and showing your profile information at the bottom of the screen. To choose a menu option, just press the appropriate number.

## COUNT CALORIES

Select option 1 to track your daily calorie intake. It starts by displaying a window containing the first ten CAL.DATA foods and their calorie counts, with the first item highlighted. Beneath the window is the submenu shown in Figure 2. Also note the current calorie count, 0 at this time, and your target count for each day at the right end of the profile area.

To add the calories for the highlighted food to the count, press 1 at the submenu. You can use the cursor-up and -down keys to scroll through the food list, the 2 key to go to the next food screen, the 3 key to back up one screen and the home key to return to the top of the list. You can also navigate the list by pressing a letter key. For example, P takes you directly to the first food beginning with P. Of course, the latter option won't work if you didn't have Calorie Data sort the food list alphabetically. To subtract the calories for a highlighted food, press 4.

When you're done logging calories for a session, press 5 to save the data you've entered for later analysis. Option 5 also sets the calorie counter back to 0. If you suddenly remember a snack you forgot to include for the day, no problem. Just add up the extra calories and access option 5 again; the weight-analysis portion of Calorie Minder (described below) can handle multiple calorie counts for the same day.

Be sure you add calorie data in chronological order; once you've logged data for one date, the program ignores any you add for an earlier date. If you get behind and add data for several days in one session, use main menu option 4 (also described below) to change dates as you proceed.

There are two ways to record the calorie value for a food that is not already listed in CAL.DATA. First, look up the value in your reference book. Then, either look through the food list for an item with the same value and record it instead, or press the home key to return to the top of the list, where you will find the following entries:

10 MISCELLANEOUS-010  
50 MISCELLANEOUS-050  
100 MISCELLANEOUS-100

These entries are specifically designed to help you log extraneous calorie amounts. For example, suppose you eat an unlisted food that has a calorie value of 230. You can add that number to the day's total by choosing two "portions" of MISCELLANEOUS-100 and three "portions" of MISCELLANEOUS-010. Of course, if you are likely to eat that food again, you should also add it to CAL. DATA later.

## **ANALYZE CALORIE LOG**

Main menu option 2 issues a report on your diet progress. The report includes your current and target weights, the number of days of calorie data in your log file, your average daily calorie intake, your weight loss (or gain) and a prediction, based on current progress, of how long it will take to reach your goal. The report also features a dot graph that shows your weight change.

When using option 2, first specify the beginning and ending dates for the report by either entering dates of your own or pressing return at all the prompts to choose the default, the last six months. If you've been logging calorie data for less than six months, you can still use the default; Calorie Minder will just process the entire log.

Next you must enter a time interval, in days, for the graph. With the interval set at the default of 7, the graph will show weekly progress, while an interval value set at 1 will chart daily progress. The graph only has room to record data for 30 intervals, however, so if you choose an interval of 1, and the log contains data for more than 30 days, dots for only the first 30 will appear.

The program also asks whether you want the report output to the screen or printer. After you make your choice, there's a brief pause as it reads the entries in your calorie log and prepares the report. Calorie Minder expects your printer to be device number 4, but you can alter this by changing the value assigned to variable PD in line 10 of the program.

## **CHANGE DATE**

Use main menu option 4 to change dates when logging calorie data for several days at once. As I mentioned before, it's important to start with the earliest date and work forward.



## EXIT PROGRAM

When you finish using Calorie Minder, leave the program by pressing 5 at the main menu. This option updates your disk profile and, if you've tallied some calorie data but not stored it, asks whether the data should be saved. Don't just press the stop key or turn the computer off to exit the program, or these things won't happen and you'll lose the day's data.

If all this seems like a heavy set of instructions, never mind. Calorie Minder is really easy to use when you get the hang of it, and it will surely lighten your dieting burden.

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RUN it right: C-64

# Type Invaders

*By Tony Brantner*

SOUND THE ALERT and prepare for battle! Those unruly characters from planet Keebord have launched an attack. Platoons of loathsome letters, nasty numbers and pugnacious punctuation marks are descending toward Earth, threatening to inundate it with gobbledygook. You have the firepower, but do you have the skill to save our endangered planet?

Well, if not at first, you will after practicing with Type-N-Fire, an entertaining way to hone your typing skills. Written for the C-64 entirely in Basic, Type-N-Fire is straightforward to play. First you select a skill level from 1, the easiest, to 9. Then the game screen appears and a block of ten rows containing eight characters each begins to move down the screen. Starting with the lowest row, type the characters from left to right—without looking at the keyboard, of course. When you hit a correct key, a laser beam will fire upward and blast the corresponding character. You win two points for each hit and lose a point for each miss.

The first platoon contains only a small assortment of Type-N-Fire's large, colorful characters, but the variety increases in succeeding attacks. A round is over when you've eliminated all the characters. Then a scorecard appears, showing your score, shots fired, hits and

accuracy percentage for that round, along with your high score for the session. Press any key to advance to the next round.

Once you've mastered all the keys, the characters will begin their descent from a lower position. If they reach the bottom, a final scorecard will appear and you can quit or play again.

If you're serious about improving your typing skills, you may wish to keep a notebook handy for recording your level and high score for each session. Then you can try to better that score next time.

Now, ready at the keyboard and type R-U-N!

---

RUN it right: C-64; 1571 or 1581 disk drive

# The MS-DOS/C-64 Connection

*By Miklos Garamszeghy*

THIS IS THE FINAL INSTALLMENT of the three-part series on exchanging text and data files between MS-DOS and Commodore computers. Part 1, in the April issue of *RUN*, presented a program that lets a C-128 read from and write to MS-DOS disks. In May, Part 2 added a program for formatting MS-DOS disks with either a C-128 or C-64. Now, we complete the picture with a program that enables a C-64 to read and write MS-DOS disks, providing a quick and easy way to transfer files between machines.

Although primarily intended for use with 3½-inch, 720K MS-DOS disks in a 1581 drive, the program also works with 5¼-inch MS-DOS disks in a 1571 drive. Note that you cannot use the program with a 1541 drive, due to that drive's different method of recording data.

You can move files of up to about 30K (120 disk blocks) in size in either of two modes: Translation mode, which converts the file from PETSCII (Commodore ASCII) to true (standard) ASCII, or Binary mode, which creates a straight byte-for-byte copy. Commodore files can be sequential (SEQ), program (PRG) or user (USR); relative files and GEOS user-type files won't work. Menus and screen

prompts make the MS-DOS/C-64 Connection easy to use.

In this article and the program, the terms "source" and "target" refer to disks being copied from and to, respectively. "MS-DOS" means any IBM-PC-type disk operating system, and "Commodore DOS" means the normal operating system in Commodore disk drives, including the 1571 and 1581.

## THE SOURCE

The opening menu asks for information about your source disk, starting with its type—MS-DOS or Commodore. Enter 1 or 2 accordingly, or 3 to quit the program.

Press the return key after making your selection, then choose the device number, 8–12, of the source drive. A number outside that range will be rejected, and you'll be returned to the source-disk prompt.

Having entered a proper device number, insert the source disk into the source drive and press return to proceed. Any other key will take you back to the opening menu, should you want to change your choices.

Assuming that you press return, MS-DOS/C-64 will read the directory of the source disk. In the case of an MS-DOS disk, it will also automatically determine the disk's type (number of sides, number of sectors per track, and so forth) and decode its file allocation table (FAT), which is similar in function to the Commodore BAM (block allocation map). Watch the screen to keep track of what's happening. This process may take a couple of minutes, mostly due to the slow speed of the serial data transfer.

On the screen, the directory takes the form of a ten-entry menu. MS-DOS subdirectories are identified by <dir> under the file-size field, while 1581 partitions are identified by the filetype CBM.

At the top of the directory screen, you'll see the disk's name and ID (Commodore DOS) or volume label (MS-DOS), along with the number of files in the directory and the total number of bytes used by these files. Note that the file sizes are expressed in bytes, not in the blocks to which Commodore users are accustomed. As a result, the sizes indicated for Commodore files are only approximate (block count times 254), while the sizes of MS-DOS files, taken right from the directory entries, are exact.

As I mentioned earlier, the program won't work with relative files or GEOS-type user files. However, these files will still be listed in a Commodore DOS directory.



To select a file to read or a subdirectory to view, press the corresponding number and then the return key. To see the next group of ten entries, press either N and return, or just return. If you want to go back to the previous group of ten, press P and return. To quit and go back to the opening menu without making a choice, press Q and return.

The file you select need not be in the group currently on the screen. For example, if the menu is showing files 11–20, you can still choose number 6, as long as you remember that's the one selected. Only numbers in the range from 1 to the number of files in the directory are valid.

*Don't* remove the source disk from the drive until you're prompted to insert another disk. Otherwise, your file may be copied incorrectly or files on the disk you insert may get damaged. MS-DOS/C-64 won't prompt you to insert a disk before it starts to read a file appearing on the on-screen directory, because it will assume that you haven't removed the disk containing the file.

After selecting the file to transfer, you must specify either Binary or Translation mode. Binary creates a new file that's identical to the original. In Translation mode, the conversion between PETSCII and ASCII occurs while the file is being read into memory.

## THE TARGET

Once the file has been read into the memory buffer, it's time to specify the target disk characteristics. At the prompt for filetype, press 1 for MS-DOS, 2 for Commodore DOS or 3 to return to the directory menu.

Assuming you want to proceed with the transfer, next select the target drive. This can be the same as the source drive or different.

Now enter a filename for your target file. For an MS-DOS file, it must take the form `FILENAME.TYP`, where the main name, containing up to eight characters, is followed by a period and then a 0–3-character filename extension or type. Commodore filenames can have up to 16 characters.

When writing to a Commodore disk, you must also choose the Binary or Translation transfer mode and the file type—SEQ, PRG or USR. Most text-file transfers use sequential files.

Now insert the target disk in the drive and press return to write the file to it.

With an MS-DOS target, because a real MS-DOS operating system is not present, the program must perform several housekeeping

tasks during the write operation. These include reading the MS-DOS directory and decoding the FAT, writing the file, and updating the directory and FAT on the target disk. With a Commodore target, all this is done automatically by the DOS.

After it has written the file, the program rereads the source directory and redisplay the directory menu. If your source and target disks are in the same drive, you'll be prompted to reinsert the source disk before the directory read.

## **SUBDIRECTORIES**

MS-DOS/C-64 lets you transfer files from any MS-DOS subdirectory or 1581 directory partition. When you select an MS-DOS entry marked <dir> or a Commodore 1581 CBM file from the directory menu, the new directory is read and displayed on the screen. You can get back to the previous directory level in MS-DOS by selecting the first entry in the new directory. That entry should be <parent> <dir>. With a 1581, you can't go back through a directory chain; you must return to the root directory and follow the chain forward. All files you write will appear in the root directory only; subdirectories are not supported in file writes.

The program recovers unused and scratched directory and data space on MS-DOS disks, but the Commodore DOS does this job automatically when writing to sequential or program files.

## **OTHER TYPES OF TRANSFERS**

While MS-DOS/C-64 is designed primarily for transferring files between MS-DOS machines and the C-64, it can be used for other purposes. One is transferring normal Commodore SEQ, PRG and USR files between a 1581 and a 1571, 1541, C-64-compatible hard drive or even an IEEE-bus type drive.

In addition to doing transfers, the program is handy for converting text files between true ASCII and PETSCII, using any Commodore-compatible drive. For ASCII to PETSCII, read the file in Binary mode, then write it in Translation mode. For PETSCII to ASCII, read the file in Translation mode, then write it in Binary mode.

# Flight of the Condors

*By Behzad Jamshidi*

CLASSIFIED: TOP SECRET. 21 December, 2021.

To: Agent A.C.E.-049832, code name Sky Runner, Earth Defense Institute.

Message: Intelligence reports that the Artificial Satellite Couriers, code name Condors, have run rampant.

Report to spacestation Strata immediately for full-scale launch of T-Wing fighters against the Condor ships.

## INSTRUCTIONS

The object of Space Condors is to shoot as many of the courier ships as possible from your T-Wing fighter, all the while avoiding collisions with them. The two Condors with distinctly red wings cannot be destroyed; the rest, with wings shown in flashing colors, are worth ten points each. You get three fighters, one at a time, for each game.

To play, just load and run the Boot program. Press the F1 key to start play, then use a joystick in port 2 to fly your fighter. Holding down the joystick firebutton launches a steady stream of laser fire at the Condors. Some of the courier ships will detect your fighter's location and try to ram it, so keep moving. Also, avoid the screen borders, because the Condors wrap around. As you play, you'll develop some strategy and your score will soar.

Space Condors is fast fun. Heard from a recent Sky Runner: "I'm glad I'm not paying for all these games!"



# Quick Writer 128

By Leonard Morris

IF YOU'RE LOOKING for a word processor with speed rather than frills, Quick Writer for the C-128 may well fill the bill. Designed to work in 80-Column mode, it offers basic editing features for both text and keyboard graphics. Moreover, it's completely menu-driven, so there's no need to memorize commands.

When you run Quick Writer, it first prompts you to enter the date and time for use in uniquely identifying the files you save for future reference. A flashing checkered cursor indicates where text or graphics will be displayed on the screen, and all typing appears above a line of reference numbers, so you can see your current character position in the screen line. The bottom screen line continuously displays the filename (if you've specified one), the time, the screen page number and the number of free bytes left in memory.

## PROGRAM MODES

**Write** mode, the mode Quick Writer comes up in, is used for entering text. The program works on a line-by-line basis, so each line must be followed by a return to place it in memory. If you exceed 78 characters in a line, a return will be issued automatically. Word wrap occurs if the 79th character is not a punctuation mark or blank space. This means that the last word on the line is placed on the next line, thus avoiding word breaks. As you type, a tone sounds at the 72nd character in a line to warn you of the approaching end.

**Save** mode, activated by pressing the F1 key, displays a list of filenames already on disk and prompts you to enter a filename for the document you're working on. If you specify a filename that currently exists, the program displays a warning that the old file will be replaced if you proceed with the save. To initiate the option to cancel the save, you just need to press the asterisk (\*) or return key.

## EDITING

**Edit** mode, activated by F2, provides numerous options for editing

your text, with the option currently in effect indicated in the bottom portion of the screen. The cursor becomes a solid block in Edit mode. To exit this mode, press the asterisk key.

The Edit options are as follows. To activate an option, press the first letter of its name.

**SPage** lets you select a new screen page to work on.

**Advance** is used to identify the screen line you want to edit by placing a highlight window on it. Only whatever line is in the window is affected by other Edit options used.

The next line of text is highlighted each time you use the Advance option, until you reach the end of the page. At that point, the highlight wraps around to the top line.

**Delete** erases the highlighted line from your text. However, the line isn't permanently lost until you do a save with the same filename.

**Change** lets you actually edit the highlighted text, using the cursor, insert and delete keys.

**Insert** enables you to insert text above the highlighted line.

**Next Page** displays the next page on the screen for editing. If the last page of your document is currently on the screen, then wrap-around takes you back to the first page.

The **Relocate** option is used in conjunction with the Here option, below. When you select Relocate, the highlighted text is removed from your work file and stored at the bottom of the screen, in the same color as its screen color option. You can relocate up to 40 lines at a time, last line first.

Lines that you select with Relocate are placed in new positions by using the **Here** option. They slip into the work file just above the highlighted line. Remember, it's first in, last out when you're using these options.

You can also use Relocate and Here to remove lines from your current work file, load a different file to work on, and then insert the lines in the new file.

**Get** and **Unget** work like Relocate and Here, except the highlighted line is copied, not removed.

**Find** highlights a particular word throughout your work file.

**Exchange** lets you change any word or phrase to any other throughout your work file. However, the exchange won't work in any line where it makes the character count exceed 78.

## OTHER MODES

**Load** mode, called by F3, lists all the files in Quick Writer's

directory and prompts you for a filename to load. To load other text files from a disk, rename them by adding the prefix (£),CHR\$(92) to the filename.

**TX-Screen** mode, which is summoned by the F4 key, lets you switch to a display of the read-only file while you're in Reader mode, described next.

**Reader** mode, F5, loads a file to view for reference, but not to work on. To redisplay your work file, press the return key; to view the read-only file again, press F4, as described above. The read-only display can be scrolled and wrapped around from end to beginning by pressing any key but return.

## PRINTING

**Printer** mode, activated by F6, is, of course, for generating hard copies of your work files. I use a Star NX-10 printer with Quick Writer; with other printers you may find it necessary to do some experimentation to get the desired results.

When printing, you can include a headline at the top of your document and a header and page number on every page. You can also select from ten type and formatting options and enter any special character codes your printer is able to handle.

The type and formatting options are selected by pressing the following keys while in Printer mode:

*Normal* type, 0.

*Italic* type, 1.

*Condensed* type, 2.

*No space* between lines, 3.

*Letter Quality*, 4.

*Small* (subscript) type, 5.

*Medium* (double height and width), 6.

*Large* (quadrupled height and width), 7.

*Centered* text, 8.

*Business* (margin set), 9.

## AND MORE MODES

Enter **Scratch** mode, F7, if you want to remove a file from Quick Writer's directory.

**Merge** mode, F8, lets you combine two different files into one work file. This comes in handy especially for printing. Merge doesn't disturb the disk files, but you can save the combined document as a new file.



## ESCAPE KEY OPTIONS

Quick Writer includes the following five options, all of which are activated by pressing the escape key and then hitting the indicated number key:

**New**—escape, 0—clears work file.

**Sort**—escape, 1—sorts disk directory.

**Sound**—escape, 2—toggles the keyboard beep on and off.

**Color**—escape, 3—is used to change the background color of the work screen.

**C-Text**—escape, 4—is used to change the background color of the line you're working on.

All of these functions make Quick Writer suitable for many word processing needs, while its menus and speed make it easy to use. Try it; I think you'll like it.

---

RUN it right: C-64 or C-128; GEOS

# AutoSet

*By William Coleman*

ONE RELATIVELY UNDOCUMENTED area of GEOS concerns auto-execute files, which, since they can be executed directly from the system disk, are ideal for anything that needs doing each time GEOS is booted. You'll explore this filetype and the program, AutoSet, which demonstrates how to use these files.

After the GEOS Kernal has been loaded and initialized, the system disk is checked for the presence of auto-execute files. Any found there are executed in the order in which they reside on the disk; so if you want a certain file to execute before any other, simply make sure it has priority in the system-disk directory. Auto-execute files on a work disk can also be called up from the GEOS deskTop in the usual way.

One of the prime candidates for an auto-execute file on the system disk is Berkeley Softworks' Configure program, which configures the disk drives and REU for your system. In most cases you should allow Configure to set things up before any other file executes;

therefore, place any other auto-execute files after Configure in the system-disk directory.

## NOTE ABOUT GEOS VERSIONS

Auto-execute files were not supported until Version 1.3 of GEOS (all 128 versions support them). However, the filetype was already allocated, so if you are using an older version of GEOS, you can still run these programs as you would a regular application, by clicking on them; but they will not automatically execute from the system disk during boot-up.

## CREATING AUTOSET

Run AutoSet with a GEOS work disk in your drive. Next, copy the AutoSet file from that work disk onto your GEOS system disk. Boot GEOS and open the system disk containing AutoSet. Test the program by double-clicking on it (the program's operation is self-explanatory) and trying all the options. From now on, whenever you boot GEOS, AutoSet enables you quickly to set the time and date.

There is one small quirk you should be aware of. When the deskTop is loaded, it searches the system disk for a specified input driver and, if it finds one, loads it into the computer. Unfortunately, this happens *after* any auto-execute file on the system disk has executed during boot-up—and the default driver is for a joystick in port 1. So if you're using a mouse, you'll find it won't work when you go to set the time and date during boot-up. AutoSet gets around this problem by allowing you to use the cursor-up and -down keys at this point (left and right movements are not needed here). One consolation is that the firebutton works normally if the mouse is in port 1.

## FOR PROGRAMMERS ONLY

For those of you who like to program under GEOS, here are some tips for creating auto-execute files:

Write the program just as you would any other application, except use filetype #14 instead of #6. All of the GEOS Kernal entries can be used. Exit by calling EnterdeskTop as usual.

Do not modify memory from \$5000 to \$6000, for this area contains the GEOS initialization code. EnterdeskTop is modified to point within this area, and if you corrupt it, GEOS will crash when your program exits.

FirstBoot (\$88C5) is zero during boot-up, but the deskTop changes

it to \$FF, and it will stay that way. This location can be checked if your program needs to tell whether it was called during boot-up. (This is why you never see the Configure screen during boot-up, even though Configure is run.)

Make certain always to verify that you are running version 1.3 or above before checking this location. If your version is 1.2 or below, your application should assume it was clicked from the deskTop.

If C128Flag (\$C013) and graphMode (\$003F) should be used, decide what computer, and if it's a C-128, under what mode the program is being run. C128Flag will have bit 7 set if running under a 128 GEOS Kernal. If it is running under 128 GEOS, bit 7 of graphMode will be set if it's in 80-Column mode. Again, check first to see whether the Kernal version is above V1.2. If the version is 1.2 or below, your application should assume a C-64 GEOS Kernal.

Remember that an input driver hasn't been loaded. You can either program the keyboard to move the mouse or use FindFTypes and ReadFile to load the driver yourself.

---

RUN it right: **C-128 (in 40-Column mode); joystick(s)**

## Betweenes

*By Leonard Morris*

PUT THE SQUEEZE on your family and friends with Betweenes, a C-128 strategy game for two or three players, one of whom can be the computer. The object is to place as many of your colored chips as possible on the squares of the game board, while your opposition is trying to do the same. When the computer plays, it's not really trying to win, but just giving you a chance to improve your strategy.

You accumulate chips of your color on the board by placing a chip (a sprite acts as the marker) on an unoccupied square so as to sandwich as long a row as possible of your opponent's chips between one of your color and the one you put down. Once you've made such a move, your opponent's "captured" chips change to your



color automatically. Note that you can capture chips only in vertical or horizontal rows, not diagonally.

You use a joystick to move the marker to the square you select and hit the fire-button to place your chip. When two people are playing, whoever has the first move uses the joystick in port 1 and his opponent uses the one in port 2. One person playing against the computer uses port 2.

A third person can play by using the numeric keypad. The 8, 2, 4 and 6 keys move the marker up, down, left and right, respectively, while the decimal point places the chip.

There are three ways to customize *Between's*. Whenever the game is in progress, you can change the screen to any one of nine colors by pressing the asterisk key. At the beginning of the game, you can change the size of the playing board from four-by-four squares to ten-by-ten. Also at the beginning of the game, you can alter the amount of time each player has to move.

Although *Between's* is written in Basic, it demonstrates the power of C-128 graphics. The playing board and chips are created in multicolor graphics, and the marker is a sprite.

---

RUN it right: C-64

## C-64 Animation Maker

*By Frank Liuzzi*

IF YOU'VE EVER WISHED for a utility that enables you to try out your graphics programming ideas quickly and painlessly, you'll find that C-64 Animation Maker is the answer. Now you can have a multicolor background of characters you've designed with the included editor, with all eight sprites moving at assembly language speed along paths you've drawn with only your joystick, each sprite flipping continuously through the four pictures you've designed for it.

To see a demonstration that's included on this ReRUN disk, press F6 and enter the filename ANIMATION DEMO at the filename prompt. When the disk drive light goes off, press F7 to begin the animation process.

Following are descriptions of the program's various functions.

### **DESIGNING CUSTOM CHARACTERS (F4 ON MAIN MENU)**

Use the custom-character editor (F4 on the main menu) to redefine some of the C-64 character set into objects you want printed onto your background screen. For example, suppose you want a display with a sprite climbing a ladder. You could use the letters A and B, say, to form the ladder by printing one over the other again and again. A very detailed screen can be made by redefining only a few characters and using them over and over.

You can employ up to four colors (dot off, plus three colors) when editing your characters. You can also reverse and clear them. Press return to go back to the main menu.

### **EDITING THE BACKGROUND SCREEN (F1 ON MAIN MENU)**

With this mode, you print the characters you made in the previous step, using the cursor keys to move about the screen. It's a good idea to make some notes of what key is currently what picture element. Once you're in this mode, the F1 key cycles reverse video on and off, and F3 and F5 change the printing color up and down, respectively.

You can print large objects on the screen by defining more than one character per picture. For example, to have an object four times as large, just create it in quarters. Then, when they're printed together, the larger object will appear. Use the return key to go back to the main menu. (Important: *Never* hit the run-stop/restore key combination in this mode.)

### **BUILDING SPRITE IMAGES (F5 ON MAIN MENU)**

This is one of the most enjoyable parts of the program. You can really breathe some life into your eight sprites by drawing four images for each one. The sprites will then flip through these images automatically.

The F1 key toggles between Entry and Edit modes. Use the Entry mode to select which picture you want to edit. Press the back-arrow key to view all 32 pictures.

Pictures 1-4 belong to sprite 0, pictures 5-8 belong to sprite 1, and so on. To get the picture you want to edit while in the Entry mode, press keys 1-8 to send that image to the large edit area. While in the Edit mode, keys 1-4 are used to change the cursor color (see the reference chart, below).

Use the cursor keys to move around the edit window. You can flip images vertically or horizontally and can reverse them using the labeled function keys (see the chart). You can also use F4 to copy one image into another. After pressing F4, you choose the image you want by pressing the appropriate key, 1-8. This sends the image into the large edit window.

With this feature, you can design one image and transfer it to the remaining three images assigned to the sprite you are working on. Make a slight modification in each of the four pictures, so you see some animation when the program cycles through them. This saves you from drawing each of the four pictures from scratch.

As an aid in designing the four images, you can press the F7 key at any time to see what the resulting animation will look like without going back to the main menu and choosing the Demo option. Press return to go to the main menu.

### **DEFINING SPRITE MOVEMENT (F3 ON MAIN MENU)**

The movement in this mode is slowed down so that you can trace out the sprites' paths accurately. The speed resumes when you leave this mode.

Moving the sprites couldn't be any easier, for the program handles all the technical details of sprite movement. In order to map out a path, all you need do is select which sprite is to move when prompted. Next, you'll see a sprite cursor in the middle of the screen. The yellow border indicates that you're in the Stand-by mode.

Move the sprite to the location where you want to start recording the path. Pressing the firebutton puts you into Record mode (red border). You can trace out any path you want, but there is a maximum path length because of memory limitations. While in Record mode, you can let go of the joystick, which puts you into Pause mode. Then pressing keys 1-4 will alter the sprite's speed.

Hold down the space bar to put you in Stand-by mode, which allows you to change to a new location on the screen. You'll be able to jump all over the screen using this option, instead of drawing just one continuous path. This makes for more interesting displays.

A few tricks can be done using the Stand-by mode. For example, you can have one sprite drawn as a point of light, like a star, and sprinkle the screen with that image. Hold down the space bar and place the star somewhere. Now wiggle the joystick for a second, just long enough for the star to be recorded in that spot. Then hold down the space bar once more, place the star elsewhere and wiggle



the joystick again for a second. Repeat as many times as you like.

The end effect will be stars twinkling all over the screen, with the use of only one sprite. To enhance the effect, when drawing the four sprite pictures for your star, put the point of light in a slightly different position so that the sprite-star looks as though it's really twinkling all over the screen.

### **DEMO MODE (F7 ON MAIN MENU)**

This is what you've been waiting for. After you make some custom characters, print them onto your background screen and design your sprite images and movement paths, this is where you come to view your creation in all its glory.

You can use this option any time you want to see how your display is progressing. Just sit back and see the fruits of your creativity. Press return to go to the main menu.

Finally, all files can be saved and loaded with F2 and F6, respectively, on the main menu. Follow the screen prompts for filename handling. ■

#### **Quick reference chart.**

##### **F1 (main menu)—Edit background screen.**

F1—Reverse video on/off.

F3—Change color of cursor up.

F5—Change color of cursor down.

Use cursor keys to move around. Pressing return saves screen to buffer and returns you to main menu.

##### **F2 (main menu)—Save file to disk.**

Sprites, custom characters, background and movement are saved. Just supply a filename. Press return to go to main menu.

##### **F3 (main menu)—Sprite movement.**

Firebutton starts recording.

Letting go of joystick puts you into Pause mode.

Pressing 1-4 in Pause mode changes speed.

Space bar puts you into Stand-by mode for new position.

Press return to go to main menu.

**F4 (main menu)—Custom-character editor.**

Keys 1-4 choose colors.

F1—Jumps to character 40.

F3—Jumps to character 80.

F5—Reverses character.

F7—Clears character.

+ and - keys—Choose character to edit.

Press return to go to main menu.

**F5 (main menu)—Sprite picture editor.**

F1—Toggles Entry/Edit modes.

In Entry mode, keys 1-8 choose which picture to edit.

In Edit mode, keys 1-4 change color of the edit cursor.

1 = Background color (dot off).

2 = Auxiliary color 0 (preset).

3 = Character color (preset).

4 = Auxiliary color 1 (preset).

Back-arrow key—Shows all four versions of eight pictures for editing.

F2—Clears sprite.

F3—Reverses image.

F4—Copies one image to another (see text).

F5—Flips vertically.

F6—Flips horizontally.

F7—Animates the four pictures per sprite.

Press return to go to main menu.

**F6 (main menu)—Load files from disk.**

Just give filename to load. (Takes time to load because of size of file.) Goes back to main menu automatically.

**F7 (main menu)—Demo mode.**

Shows all of the different elements together.

The sprite at the bottom can be controlled by joystick.

Press return to go to main menu.

# **RE** **RUN**

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C-128 Word Processor ▶ GEOS Program

### *From the May RUN:*

- ▶ MS-DOS Disks to Order
- ▶ Arithmetic-Tac-Toe
- ▶ Box Scores
- ▶ Anatomy of Calculations
- ▶ Solitaire Extraordinaire

### *From the June RUN:*

- ▶ Calorie Counter
- ▶ Type Invaders
- ▶ The MS-DOS/C-64 Connection
- ▶ Flight of the Condors
- ▶ Quick Writer 128
- ▶ AutoSet

### *Plus: Extra Bonus Programs!*

- ▶ Between
- ▶ C-64 Animation Maker

If any manufacturing defect becomes apparent, the defective disk will be replaced free of charge if returned by prepaid mail within 30 days of purchase. Send it, with a letter specifying the defect, to:

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Replacements will not be made if the disk has been altered, repaired or misused through negligence, or if it shows signs of excessive wear or is damaged by equipment.

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